A CROSS SECTIONAL STUDY TO ESTIMATE THE PREVALENCE OF UNDER WEIGHT IN CHILDREN OF AGE 6 MONTHS TO 6 YEARS IN URBAN SLUMS COVERED UNDER ICDS PROJECT OF NORTH CHENNAI

Dissertation submitted for

M.D. Community Medicine

Branch XV Degree Examination

THE TAMIL NADU DR. M.G.R.

MEDICAL UNIVERSITY CHENNAI,

TAMIL NADU

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CERTIFICATE

This is to certify that this dissertation titled ‘A cross sectional study to estimate the prevalence of under weight in children of age 6 months to 6 years in urban slums covered under ICDS project of north chennai’ submitted by Dr. K. Gayathri to the Tamil Nadu DR. M.G.R. Medical University, Chennai, is in partial fulfillment of the requirement for the award of MD Degree Branch XV and is a bonafide research work carried out by her under my direct supervision and guidance.

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DECLARATION

I, Dr. K. Gayathri, declare that I carried out this work on 'A cross sectional study to estimate the prevalence of under weight in children of age 6 months to 6 years in urban slums covered under ICDS project of north chennai' at the Institute of Community Medicine, Madras Medical College, during the period of July 2006 to September 2006.

I also declare that this bonafide work or a part of this work was not submitted by me or any other for any award, degree, diploma to any university, board either in India or abroad.

This is submitted to the Tamil Nadu Dr. M.G.R University, Chennai, in partial fulfillment of the rules and regulations for the MD degree examination in Community Medicine.

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INDEX

INTRODUCTION

INTRODUCTION

Survival, growth and development in the earliest years of life are fundamental for the future of every individual and for the future of the societies into which those individuals are born. However, these crucial formative years remain a time of peril and loss—disease and malnutrition not only claim the lives of millions of children throughout the world, but they also damage their growth and development, diminish their quality of life in the present and compromise their future.

Physical growth is a very sensitive indicator of nutritional and health status in infants and young children. Under nutrition is associated with greater risks of death (Pelletier et al., 1994), severe infection (Black et al., 1984) and delayed cognitive and psychomotor development (Pollitt et al., 1993). Most growth retardation occurs very early in life. The two periods of highest vulnerability are 1.During intrauterine development 2.Between 6 and 24 months of age when the child is making the transition from exclusive reliance on breast milk to consumption of the family diet (Brown and Begin, 1993). An infant born at low birth weight is at higher risk of mortality and morbidity and a variety of developmental problems. Prevention of under nutrition in infants and young children is critical because growth deficits are generally not recouped, even with adequate feeding in later years (Martorell et al., 1992; Martorell, 1995). From the perspective of public policy and expenditures for social services, the

costs of many types of nutrition interventions are low relative to the potential benefits and relative to other health interventions (McGuire, 1996).

A study done to assess the malnutrition of children and factors contributing to it helps us to understand the magnitude of the problem, guides us in intervening appropriately and prevents long-term problems arising out of under Urban slums are prone for multitude of health problems and children are more vulnerable than adults. If they are undernourished the vulnerability considerably increases. The synergistic effects of inadequate or improper food intake, repeated episodes of parasitic or other childhood diseases such as diarrhoea, and improper care during illness often cause malnutrition among children. Poor sanitation services in urban slum settlements and high population density increases disease transmission. This study is aimed at finding out the magnitude of the problem and the attitude of the adults in seeking health in urban slums of north chennai. This can enable the programmers and policy makers to design relevant methods for combating the illness.

The global community has designated halving the prevalence of underweight children by 2015 as a key indicator of progress towards the millennium development goal (MDG) of eradicating extreme poverty and hunger. It appears that economic growth alone, though impressive, will not reduce malnutrition sufficiently to meet the MDG nutrition target. If this is to be achieved, difficult choices about how to scale up and reform existing nutrition

programmes or introduce new ones have to be made by the government of India and other agencies involved in nutrition in India. For already existing programs like ICDS, Evaluation of their performances by measuring sensitive indicators helps them to tailor their methods of functioning based on the results. So this study is done in ICDS project areas.

The relationships among health, physical growth, psychological development and parental caregiving have become clearer. There is an extensive scientific basis for the effectiveness of interventions to promote growth and to promote psychological development, even under poor socio-economic and environmental conditions. It will be possible to promote growth and development in the children of urban slums if we fill the lacunae in this approach.

Hence this study is done to estimate the prevalence of under nutrition in children in the urban slums of north chennai to know the magnitude, to find out the possible factors that could be associated with it and understand the mothers' health seeking behaviour for childhood illnesses.

OBJECTIVES

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1. To estimate the prevalence of underweight in children of age 6 months to 6 years in the urban slums of north chennai, covered under ICDS project area.

2. To identify the possible factors associated with under weight in the above said group.

3. To determine the health seeking behavior of mothers for acute diarrheal diseases and acute respiratory infections in these children.

JUSTIFICATION

JUSTIFICATION

It is projected that more than half of the Indian population will live in urban areas by 2020 and nearly one third of this urban population will be of slum dwellers. The ongoing process of rapid urbanization has deleterious repercussions on health and nutrition especially for children. Malnutrition in young children has long-term negative effects on physical and cognitive development. Addressing nutritional problems of urban poor is therefore must for overall development of the country (NFHS-2, 1998-99).

ICDS is doing a good job in preventing malnutrition and also in treating it. Though they claim to have almost eliminated grade 3 malnutrition, the prevalence of grade 1 & 2 malnutrition cannot be taken for granted. To prevent the children in these 2 categories from falling to grade 3, we need to consistently monitor their prevalence.

The health of the children in urban slums is threatened as a result of living amid filthy conditions in flimsy, makeshift and overcrowded housing (Awasthi S, 2003). Since they are under served and unreached by the health personnel, vulnerability for worsening of malnutrition cannot be over looked.

Even though there are many studies done on prevalence of under nutrition, factors associated with them, like time of weaning, episodes of diarrheal diseases, differ between areas and people. Knowing the reasons for under

nutrition enables the planners to tailor the existing model to the needs of the community.

In view of the above reasons, this study of prevalence of undernutrition was conducted in pre school children of urban slums in north chennai and health seeking behaviour of the mothers for childhood illnesses determined.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

URBAN POOR AND UNDERNUTRITION

Causes of Poor Nutritional Status in Urban Poor Children.

1. Inadequate food intake
    - Improper infant feeding practices
    - Lack of exclusive breastfeeding
    - Late introduction of solid mushy foods
    - Dilution of milk
    - Poor caloric and nutritional content of food
    - Inequitable intra-familial distribution (Age and gender differences)
2. Illness (Recurrent diarrheal and ARI morbidity)
    - Poor environmental and housing conditions.
    - Lack of hygiene and sanitation facilities
    - Inadequate access and utilization of health care
    - Poor food hygiene
3. Deleterious caring practices
    - Absence of responsible adult caregiver.
    - Lack of knowledge regarding food requirements.
    - Traditional beliefs

- Parental illiteracy
- Poverty

4. Service issues

- Lack of reach and co-ordination of public sector services.
- Inadequate training and supervision of service providers in nutritional counseling.
- Missed opportunities for counseling.
- Compromised efficiency of services and programs (Urban ICDS, PDS and others).
- Inadequate targeting of the urban poor.

Shanti Ghosh (2004)

Under-nutrition is an important factor contributing to high morbidity and mortality among children (Department of Medical Health and Family Welfare, Government of Uttaranchal.

NUTRITION AND MENTAL DEVELOPMENT

Development of the brain is much more vulnerable to environmental influence than has been suspected. Nutrition is the most obvious example, but the quality of interaction and a child's cumulative experience (health, nutrition, care and stimulation) during the first 18 months leads to developmental outcomes, which for children from poor environments may result in irreversible deficits.

The influence of the early environment on brain development is long lasting. Children's early exposure to good nutrition, toys and stimulating interaction with others has a positive impact on children's brain functions at age 15, as compared to peers who lacked this early input, and the effects appear to be cumulative. Improving a young child's health and nutrition, and providing opportunities for stimulating interaction and early education can bring a high economic return to society as well as to the individual (Young M, 1996).

INTEGRATED CHILD DEVELOPMENT SCHEME

In 1974, India adopted a National Policy for Children as an indication of its commitment to ensure the delivery of comprehensive child development services to all children. ICDS was conceptualized as the service-delivery mechanism. The primary beneficiaries in urban scheme were (and continue to be) the poorest of the poor found in urban slums and urban areas, particularly children in scheduled castes and tribes. Those for whom the services are provided include pregnant and lactating women and their children up to the age of school-entry. Health, nutrition and early stimulation for psychosocial development for children are all components of the programme.

Originally established in 1975, the Integrated Child Development Services (ICDS) program is the world's largest early child development program. It is a holistic intervention, consisting of health, nutrition and education components, that reaches children under six years of age through a network of community-

level anganwadi centers and will eventually be universalized across all administrative blocks in India. Over time, the program has grown in its scope, from a pure food supplementation program to a program that adopts a more multi-dimensional approach to child well being, incorporating health, nutrition and preschool education components. It targets a range of interventions at young children and their mothers, including growth-monitoring, immunization, health check-ups and supplementary feeding, as well as nutrition and health education to improve the childcare and feeding practices that mothers adopt An additional component focusing on adolescent girls' nutrition, health, awareness, and skills development was added in some blocks in 2000. Preschool education is provided to children between three and six years of age.

The coverage of the program has expanded rapidly, especially in recent years. From an initial 33 blocks in 1975, the program grew to 4,200 blocks circa 2000, and to over 5,500 by 2003 (DWCD 2003). By 2004, there were almost 600,000 anganwadi workers and an almost equal number of anganwadi helpers providing services to beneficiaries throughout the country. The program currently reaches 33.2 million children and 6.2 million pregnant and lactating women (DWCD 2004). In its February 2005 Budget address, the Government of India announced its intention to construct an additional 188,000 anganwadi centers and attain universal coverage of the program, (2002-2007). (Caryn Bredenkamp 2005) Several donors, including UNICEF, SIDA, WFP, CARE, NORAD and the World Bank, support the program (DWCD).

AGE AND NUTRITION

Supplementary feeding of infants and young children has resulted in significant increases in “broad measures of cognitive development”. In her review of the effects of nutrition supplementation on psychological development, Gorman (1995) concluded that gestation and the first two years of life are the most important periods for supplementation, and that longer duration of supplementation is also associated with better outcomes.

SEX OF THE CHILD AND UNDERNUTRITION

In South Asia and China, where discrimination against girls has been most clearly documented, girls have been found to receive less timely medical care, a smaller proportion of the family food, and less breastfeeding. Gender differences can also be seen in son preference, or the ratio of women who state that they would like their next child to be a boy compared to those who would their next child to be a girl. In South Asia, boys are strongly preferred. Survey carried out in rural Kerala found that a higher percentage of boys (82.7%) than girls (75.5%) under-six are malnourished by the Gomez classification (National Institute of Nutrition 2002). Elsewhere in the South Asia region, Trapp et al. (2004) highlight the disappearing sex bias in child health in Bangladesh. Moreover, the sign on the gender coefficient in the economics

literature on the determinants of child health in South Asia is not consistently pointed in the same direction. Example, Bangladesh (Chauduri 2004),

BIRTH ORDER

Birth order can be a determinant of how children are cared for. First-born children raised by a maternal grandmother, which may or may not be an advantage, depending on the care provided by the grandmother, but it is likely to be different from what the mother provides. In general, those born later (fifth or higher) receive less adult attention.

BIRTH WEIGHT AND CHILD DEVELOPMENT

In the slums of Dhaka, Bangladesh, where the low birth weight prevalence is as high as 46.4%; (70% of them being SGA infants and 17% premature), it was found that the catch-up growth was limited and that although the weight at 12 months of age was largely a function of weight at birth, there was a greater plasticity of growth in the first 3 months of life than later in the first year, suggesting that these infants may respond to targeted postnatal interventions during the first three months of life (Shams EA, 2000) Low birth weight is the major adverse outcome for the infant and an important determinant of increased child mortality. Weight gain in a child with history of low birth weight is significantly less than the ones with appropriate weight (Mehra S, 2004).

MOTHER'S ROLE IN CHILD'S NUTRITION

There is evidence that in large parts of India women have low autonomy in the household, which diminishes their ability to use household resources to protect their children's health, as well as take decisions to seek healthcare when they feel it may be necessary (Das Gupta 1999).

Smith et al. (2003), for example, find quantitative evidence that women's status is associated with better child feeding practices, especially early initiation of breastfeeding and the timely introduction of good quality complementary feeding. In the absence of better measures of women's status, the age at which the child's mother was married is included as an indicator of the mother's status within the household and the community. The hypothesis is that the younger the age at marriage, the less power the woman may have to direct household resources towards her children's nutritional health, and she may also have been less likely to lay claim to household resources to meet her own nutritional needs during pregnancy

ANTE NATAL CARE

Minimum of 3 antenatal visits, first at 20 weeks or as soon as the pregnancy is known, second at 32 weeks and third at 36 weeks is advised (Park and Park, 2002). Health care practices, common in slums, like limiting the antenatal

health care services for the first delivery and relying on untrained dais for conducting delivery at home etc. often result in adoption of unscientific health practices like incomplete immunization, insufficient check up during pregnancy, unsafe deliveries at home and improper post-natal care of mothers and newborn. These practices increase the risk factors for developmental delay, like infection with rubella in the first trimester of pregnancy, intrauterine infections, premature delivery, perinatal problems like birth asphyxia, hypothermia, and hypoglycemia.

ANAEMIA/UNDERWEIGHT IN MOTHERS AND PREGNANCY OUTCOME

Anemia is widespread among women. Overall, 52 percent of women in India have some degree of anemia and 40 percent or more of women in every population subgroup are anemic. Anemia is a serious concern for women because it can be an underlying cause of maternal and infant death. It can also increase the risk of premature delivery and low birth weight. Pregnant women are much more likely than non-pregnant women to be moderately to severely anemic. (NFHS2)

The birth weights of newborns appear to be linearly correlated with both maternal body weight and height. (Naidu et al 1991) demonstrated that mean birth weights of infants improved as the BMI value moved from grade <16.0 to BMI value between 8.5-25.

SUPPLEMENTARY FEEDING FOR PREGNANT AND LACTATING MOTHERS

A recent review of seven trials shows that supplementation was associated with increases in maternal weight gain and mean birth weight, and a decrease in the number of small-for-gestational age (SGA) babies when the rate of LBW was reduced by 33 percent (Ceesay et al., 1997).

BREAST FEEDING AND CHILD DEVELPOMENT

In the first six months of life, malnutrition tends to be less common if the mother is Breastfeeding exclusively. During this period, the most important care practices are centered on the lactating woman and her breastfeeding. Investments made in children's nutrition during this time can result in a significant decrease in rates of malnutrition both for the children themselves, and for the next generation Data from seven studies of the effects of breastfeeding on psychological development during infancy and at later ages were summarized by de Andraca et al. (1998). These studies indicate significant differences in the test scores of the children ranging from 4 to 10 IQ points. Children who were given only breastfeed for two months weighed 4.5 (SD: 3.9) kg as compared to 6 (SD 4.5) kg for children exclusively breastfed for 6 months (Aneja B, 2001).

IMPACT OF ICDS ON NUTRITION

Bhasin et al (2001) used a sample of 1,243 older children (aged 7-13) in Delhi and found that children who attended ICDS in childhood are not at a significantly lower risk of malnutrition than non-participants. Swami et al (2001) used a sample of 1,286 preschool children in Chandigarh and found that the prevalence of protein-energy malnutrition (PEM) is significantly higher among beneficiaries of ICDS than non-beneficiaries; Trivedi et al (1995) used a sample of just over 1,200 children in Madhya Pradesh and found that there's no statistically significant difference in nutritional status between children living in a block with ICDS services and children living children in a block without ICDS services. By contrast, Saiyed and Seshadri (2000) report that increased ICDS service utilization among 0-36 months (n=610) is associated with improved nutritional status. All these studies rely on descriptive statistics to capture ICDS impact.

BOTTLE FEEDING

Bottle-feeding has a direct effect on the mother's exposure to the risk of pregnancy because the period of amenorrhoea may be shortened when breastfeeding is reduced or replaced by bottle-feeding. Because it is often difficult to sterilize the bottles properly, the use of bottles also exposes children to an increased risk of getting diarrhoea and other diseases.

WEANING

The children are at substantial risk of malnutrition because of the tendency to introduce semisolid foods later than the recommended age. Lessons from the past indicate that intervention programs consisting of improved dietary practices and all-round socio-economic development rather than distribution of synthetic vitamins and micronutrients can bring the improvement in nutritional status of population.(Gopalan, 2001). Semisolids were given to 47% at 6-7 months leading to a mean higher weight by 2.5 kg as compared to children not consuming semisolids. (Aneja B, 2001)

GROWTH MONITORING AND NUTRITION EDUCATION

A study in Bangladesh evaluated how nutrition education provided by community volunteers affected diet and growth of infants (Brown et al., 1992). Over a five-month period, children in the intervention villages gained an average of 460 grams (0.46 SD) more weight for age than children in the control villages. A significantly greater percentage of the children in the control group became severely malnourished, demonstrating a preventive effect of the nutrition education. The energy and protein adequacy of foods given to children improved among intervention children and declined among controls.

World Bank evaluators found that frequency of weighing, lower age at enrollment, and immunization were all significantly associated with improved nutritional status, while deworming and vitamin A supplements were not. (World Bank, 1995).

Even with regular weighing, growth monitoring is effective only if accompanied by communication for behaviour change that results in the improved growth of the malnourished child. Previous studies of ICDS have noted that this does not often occur, because AWWs fail to effectively communicate the meaning of children's growth patterns to mothers (Vasundhara and Harish 1993).

Indeed, the ICDS III baseline/ICDS II end line survey reveals a very large discrepancy between the child's measured weight and the mother's subjective assessment of her child's growth status: in Kerala, for example, all mothers surveyed reported that their children are experiencing normal growth, and in Uttar Pradesh where underweight prevalence the sample is 46 per cent, 94 per cent of women describe their children's nutritional status as "normal" [Bredenkamp and Akin 2004]. As an educational tool, growth monitoring and promotion (GMP) activities can: Raise mothers' and health workers' awareness and knowledge of the importance of physical growth and practices that promote physical growth— hence motivating behaviour change.

Studies to test the first mechanism have shown that growth monitoring facilitates awareness among health workers of the importance of physical

growth as an indicator of child well being. It also facilitates awareness among mothers (Ruel et al., 1990) when appropriate growth charts are used and growth monitoring is accompanied by appropriate nutrition education.

NUTRITION AND ILLNESS

The synergistic effects of inadequate or improper food intake, repeated episodes of parasitic or other childhood diseases such as diarrhea, and improper care often cause malnutrition among children during illness. (Pelletier DL, 1995).

The most common health complaints for children worldwide relate to diarrhea, pneumonia, malaria, measles, and malnutrition-frequently in combination. Recognizing the complex overlap of symptoms and effects, WHO and UNICEF have developed a health care approach of looking at each child's condition as a whole rather than targeting single diseases as in the past. The World Bank's World Development Report 1993 cited new, integrated approach as a cost-effective health intervention for low income and middle-income countries and predicted that it would do much to reduce the global burden of disease. One of the approaches is widespread promotion of such preventive interventions as immunizations, breastfeeding, and improved nutrition.

METHODOLOGY

METHODOLOGY

STUDY DESIGN**:**

This study was done as a cross sectional descriptive study

STUDY AREA:

Study was conducted in the urban slums of north chennai covered under the ICDS project. North chennai was chosen because the clusters of slums and poor socio economy conditions made the children more vulnerable for under nutrition and so the study results can be more usefully applied to that population.

STUDY PERIOD:

From July 2006 to September 2006.

STUDY POPULATION:

Children of age between 6 months and 6 years residing in the urban slums of ICDS project area in north chennai.

SAMPLE SIZE CALCULATION

According to National Family Health Survey -2 prevalence of underweight in under- 5 children was 37%. Taking that as the 'index prevalence' sample size was calculated using the formula

$$N = \frac{1.96 \times 1.96 \times p \times q}{d \times d}$$

$$= \frac{1.96 \times 1.96 \times 37 \times 63}{5.55 \times 5.55}$$

Where 1.96 is the confidence interval,
p = prevalence =37%
q = (100-p) = 63%
d = precision value (15% of p) = 5.55

= 290.71 ~ 291

SAMPLING METHOD:

For selecting 291 children, Sampling was done by multi stage technique

There are totally 12 ICDS projects functioning in Chennai Corporation. 5 projects (1, 6, 7, 9 and a part of 2) cater north chennai. By simple random sampling, project area 6 was chosen from the 5 project areas. There are totally 90 centers in project area 6. All ICDS centers in project area were listed from the C.D.P.O. (Child Development Project Officer) office. Those centers that are functioning in the urban slum areas were enlisted and of them 12 centers were chosen by simple random sampling. The selected 12 ICDS centers of north chennai cater a population of 13382. Population of 6-month to 6 years old children was 1544. Population of all urban slums is 13,84,421 and children of age between 6 months and 6 years are 1,64,128.

The anganwadi workers in the centers were responsible for 200-300 households. They maintained the name of the streets and the vital data. The addresses of the houses with children between the age group 6 months and 6 years were noted. 25 children chosen by simple random sampling from each area were included in the study for all the 12 centers to get 300 children. Another 10 children were added to the list to overcome non-availability of children in that house or refusal of participation in the study

QUESTIONNAIRE:

The questionnaire for this study was developed based on UNICEF Multiple Indicator Cluster Survey Questionnaire, modified for our country with the help of the guide. It was pre tested by a pilot study in an area similar to the study population not included in the study, necessary modifications were made and the final questionnaire was prepared. It was prepared in both Tamil and English. The final questionnaire consists of the following details

Socio demographic profile of the child's family: Parents' age, marital age, religion, education, occupation, per capita income of family

Antenatal/intranatal care of mother: no. of A/N visits, place of A/N care, h/o anemia, supplementary feeding, immunization, intake of IFA tablets, place and mode of delivery. Antenatal card of mothers and immunization cards of children were asked for. If not present, recalling of details noted.

Feeding practices for child: initiation of breast feeding, duration of exclusive and continuous breast feeding, time of weaning and weaning foods.

Health/nutritional education and health seeking behavior: for mother and child regarding nutrition, immunization and for childhood illnesses (ARI/ADD)

Child's profile: age, sex, order of birth, birth weight, gestational age at delivery, weight, grade of nutrition.

A copy of the questionnaire is enclosed in appendix-1

To grade the nutritional status of the children based on their weight, chart used by the AWW under in ICDS program was used. The chart contains normal, grade 1, 2, 3 and 4 classifications with upper and lower limit of weights in each category for every month from birth to 60 months.

DATA COLLECTION

INTERVIEW

The mother or the immediate caregiver of the child if mother not available was interviewed in the absence of the AWW to prevent hesitation in providing information, with the questionnaire in their homes. At the start of the interview, the purpose of the study was explained to the informant. After getting oral consent, they were interviewed. Antenatal cards of the mothers and immunization cards for the children were checked in those who had the same. Majority did not have the cards and so recollection of details was documented. Missed informants on first visit were interviewed after 4-5 days by a revisit.

WEIGHT MEASUREMENT

Though height, mid upper arm circumference, head and chest circumference etc., is to be measured for assessing the nutritional status, along with weight, in order to do a rapid assessment, single parameter was used in this survey. Weight for age alone was calculated. Weighing of the children was done with a pediatric portable-weighing machine. The same machine was used throughout

the study. Weighing was done with minimum dressing and without footwear after the scale was adjusted to zero reading. Accuracy of the scale was checked every week with standard weight. Single investigator weighed all the children.

ANALYSIS

Data entry was made in excel software in codes and Analysis was done with SPSS package. Prevalence is expressed in Percentage and associations with the factors were tested for significance using chi square test.

DEFINITIONS

Definitions of the terms used in this study:

Term child: child born from 37 completed weeks to less than 42 completed weeks of gestation

Preterm child: child born before the end of 37 weeks gestation

Low-birth weight infants: children that weighed less than 2,500 grams at birth

Antenatal care: Proportion of women aged 15-49 years that were attended at least

Thrice during pregnancy by skilled health personnel

Supplementary nutrition for mothers: mothers who consumed the ready to eat food preparation provided by the AWW, during antenatal and lactation period

Institutional deliveries: Proportion of births delivered in a health facility

Underweight prevalence: Proportion of children under 6 of grade 1,2,3 according to the chart followed by the AWW in ICDS centers.

Exclusive breastfeeding rate: Proportion of infants that are exclusively Breastfed till at least 4 months of age.

Continued breastfeeding rate: Proportion of children that are breastfed after initiation of weaning.

Weaning: complementing breast milk with solid/semisolid or other feeds

Prevalence of ARI: Proportion of children with acute respiratory infections in the last 2 weeks preceding the time of survey

Prevalence of ADD: Proportion of children with acute diarrheal disease in the last 2 weeks preceding the time of survey

Diarrhea: Diarrhoea is determined as perceived by mother or caretaker, as three or more loose or watery stools per day, or blood in stool.

Appropriately immunized children: Proportion of children who received DPT1-3, OPV 1-3, BCG and measles vaccines at the appropriate age

RESULTS AND DISCUSSON

RESULTS AND DISCUSSION

Totally 309 children had been studied in the urban slums of north chennai from 12 ICDS center areas. Total population was 13,382. The population studied belonged to age 6 months to 6 years. Their population was 1544. (Table 1)

Table 1

AGE WISE DISTRIBUTION OF STUDY POPULATION IN EACH AREA

ICDS center	Area popn	No. Of children in each age group					TOTAL 0-6 yrs
		0-6m	6m-2y	2y-3y	3y-5y	5y-6y	
Number							
507	1010	4	32	22	59	13	130
506	1003	10	31	32	62	16	151
666	1195	7	43	27	48	17	142
508	1033	23	37	40	58	21	179
518	1100	11	27	22	52	18	130
517	1344	15	43	36	66	22	182
510	1007	10	42	26	43	16	137
534	1091	10	29	20	44	12	115
535	1028	5	33	21	59	11	129
537	996	6	26	18	31	21	102
538	1246	13	32	30	41	14	130
523	1329	15	26	28	56	21	146
TOTAL	13382	129	401	322	619	202	1673

Study Population (6months-6yrs) = (0-6 yrs)-(0-6 months)=1673-129= 1544

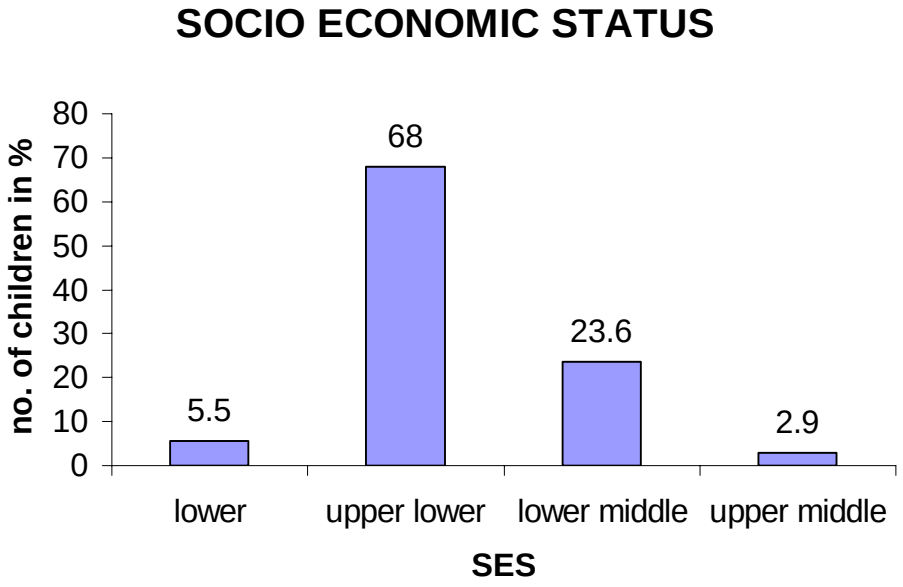
A.SOCIO DEMOGRAPHIC PROFILE:

A.1.Socio economic status:

According to modified kuppusami scale for urban population 68% of the children belonged to upper lower class. 23% from lower middle, 5.5% from lower and 2.9% from upper middle were the other constituents.

Figure 1 shows the proportion of families under each class.

Figure 1



A.2.Mean age of parents at marriage

Mean age of marriage for mothers was 18.39 years and for fathers was 23.71 years.

The median age at marriage is 17.4 years in 1998-99. (NFHS-2). The study shows the mean of the marital age a year older to the national average.

Mean age at marriage among female adolescents is 14.7 years (Narayanan P, 2000)

Table 2

MEAN AGE OF PARENTS AT MARRIAGE

	N	Mean (years)
Fathers' age at marriage	309	23.71
Mothers' age at marriage	309	18.39

A.3.Education of parents

33.3% of the mothers and 38.5% of the fathers were illiterate. Nation's average is 25% and 50% in men and women respectively according to Padam Singh ICMR. According to NFHS-2 Tamil Nadu has illiteracy rate of 41.7% in women. The study area has a better literacy rate than the state's average.

(Table 3)

Table 3

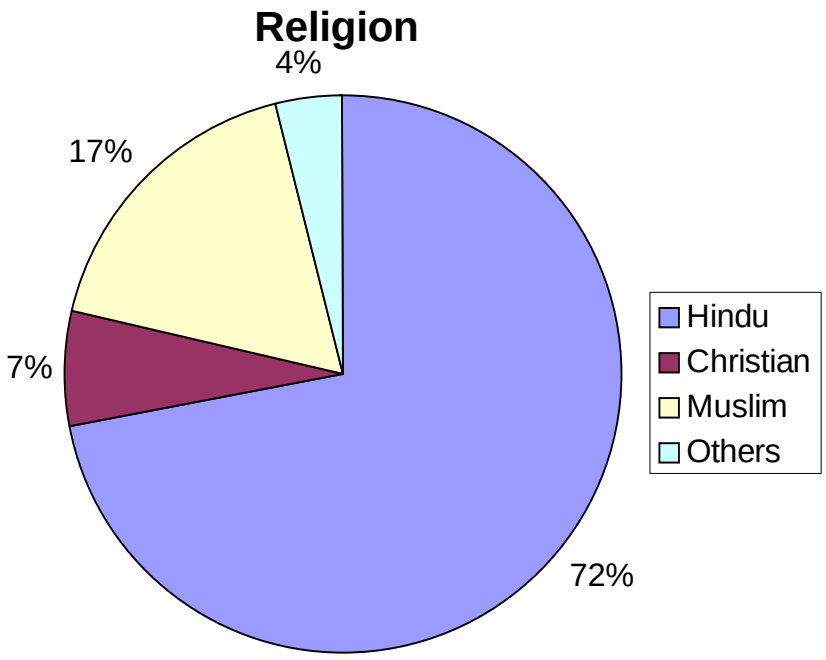
EDUCATION STATUS OF THE PARENTS

Education status	Mothers (%)	Fathers (%)
Illiterate	100(33.3)	119 (38.5)
Primary School	37 (12)	51 (16.5)
Middle School	87 (28.2)	80 (25.9)
High School	72(23.3)	43 (13.9)
Higher Sec./Diploma	13(4.2)	16 (5.2)
Total	309 (100)	309(100)

A.4.Religion of the study population

72% (222) of the children were Hindus, 17%(54) Muslims, 7% (21) Christians and 4% (12) belong to other religion. (Figure 2)

Figure 2



A.5. Age wise distribution of the children in the study

44% of the children were between the ages of 2-3 years, and 30.4% between 3 and 4 years. Only 3 children were above 5 years.(Table 4)

Table 4

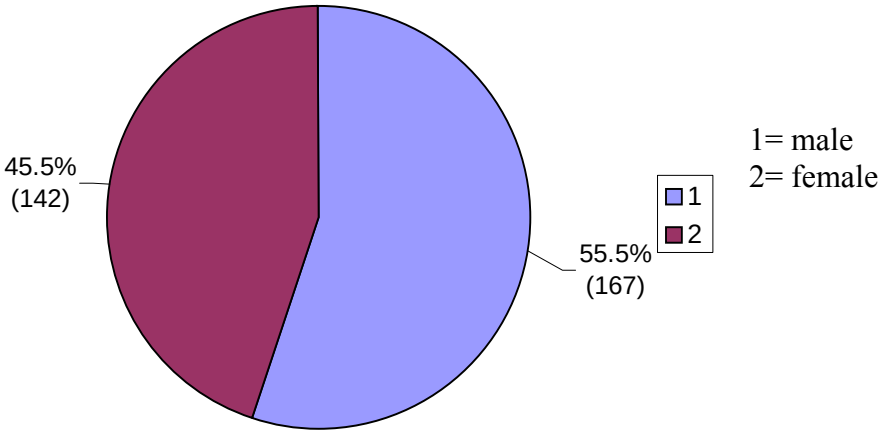
AGE DISTRIBUTION OF CHILDREN

Age in months	No. of children	
	Count	%
< 24	19	6.1
24 - 35	136	44.0
36 - 47	94	30.4
48 - 60	57	18.4
> 60	3	1.0
Total	309	100.0

A.6. Sex wise distribution of the children in the study

Figure 3

SEX DISTRIBUTION OF CHILDREN



55.5 % of children were males and 45.5% females.

A.7. Distribution of children by birth order

(172) 55.7% are of children are of second order, (109) 35.3% belong to second order. (27) 9% were of the order 3 and more. (Table 5)

Table 5

DISTRIBUTION OF CHILDREN BY ORDER OF BIRTH.

Order of Birth	Frequency	Percent
1	109.0	35.3
2	172.0	55.7
3	26.0	8.4
4	1.0	0.3
5	1.0	0.3
Total	309.0	100.0

A.8.Parity of mother

40 mothers (13%) did not adopt 2 child norm. 87% had two or one child only. For 1998-99 the unmet need was 15.8%; 8.3% for spacing and 7.5% for limiting.(NFHS-2) Here in this study 13% is the unmet need for limiting. (Table 6)

Table 6

PARITY OF MOTHER

	Mothers	
Parity	No.	%
1	35	11.3
2	234	75.7
3	35	11.3
4	4	1.3
5	1	0.3
Total	309	100.0

B.ANTE NATAL CARE

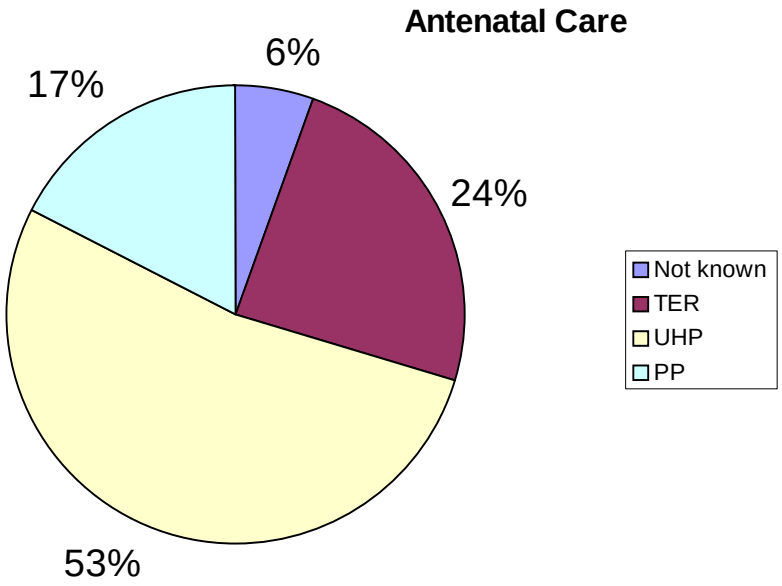
B.1.Antenatal visits

All mothers (100%)have visited health care worker (doctor/vhn) at least thrice during their antenatal period. NFHS-2 results for Tamil Nadu show that mothers received antenatal check-ups for almost all births (99 percent) during the three years preceding the survey (compared with 95 percent in NFHS-1). The finding goes on par with the survey. % Of Mothers Received ANC, INDIA- 44%.

B.2.Place of antenatal care

53% of mothers sought antenatal care in the government urban health posts of north chennai. 24% had check ups in government tertiary care hospital.17% went to private practitioners. (Figure 4)

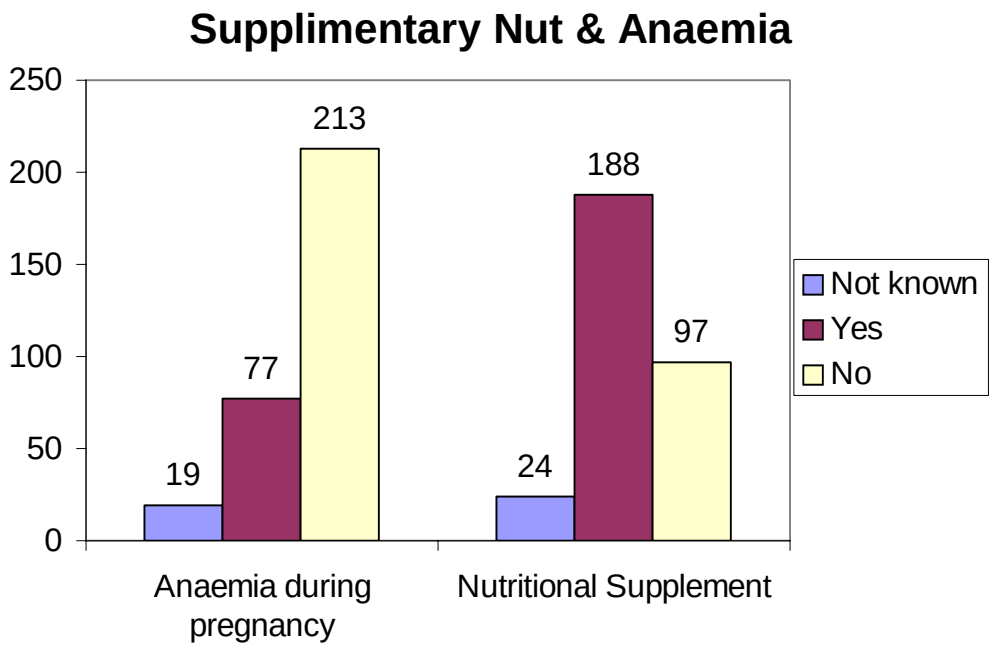
Figure 4



B.3Anemia and nutritional supplement

The anemia status of 19 (6.2%)mothers is not known. 77 (25%) had history of anemia and 213 (68.8) denied such a history. Survey by NFHS 2 in 1999 in Tamil Nadu reports anemia in mothers as 13%. The prevalence is almost double in this study. Probably the sampling for the NFHS could be from whole urban area whereas this study being done in urban slums alone shows higher percentage.

Figure 5



Almost one third of the mothers, 97 (31.4%)have not taken supplementary nutrition provided by the anganwadi worker. 188 (60.84%) report intake of supplementary nutrition.

In a study done in an ICDS area, most mothers did not receive any supplementary nutrition during pregnancy (64.7%) and during lactation (71.3%). Only 8.8% and 12.5% received supplementary nutrition regularly during pregnancy and during lactation, respectively. (Kakkar M, 1995).

B.4.TT immunization and IFA tablets intake

The mothers for TT injection in the antenatal period report 100% immunization. 95.4% coverage is shown in NFHS 2 for the nation.

Mothers in Tamil Nadu received IFA supplements for 93 percent of births according to NFHS 2.

This study report shows a better performance than such coverage.

C.PERINATAL CARE

C.1.place of delivery

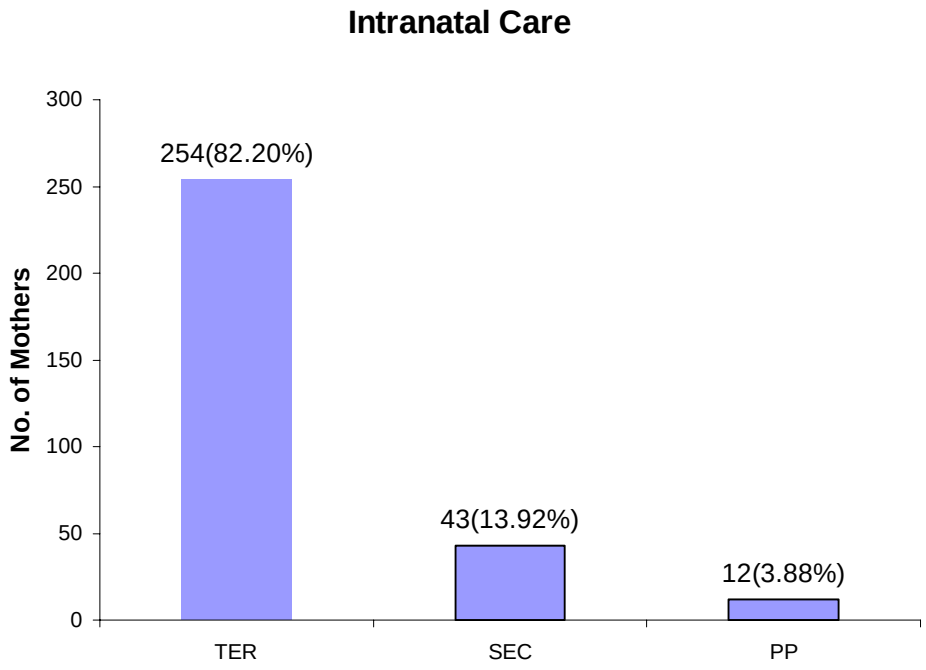
All mothers had institutional deliveries.

Majority (82.2%) of the mothers got their babies delivered in a tertiary government hospital, 13.92% in secondary health care centers (urban health posts) and 3.88% in private hospitals.(Figure 6)

For each birth during the three years preceding the survey, 79 percent of Births in Tamil Nadu took place in health facilities (up from 64 percent in NFHS-1), 13 percent took place in women's own homes, and 7 percent took place in parent's homes. Births occurring in health facilities were about equally divided between those that took place in private health facilities and those that took place in public institutions (such as government-operated district hospitals.

This study shows no home deliveries and owing to poor socio economic conditions not much deliveries took place in private hospitals.

Figure 6



TER=Tertiary government health care

SEC=Secondary government health care

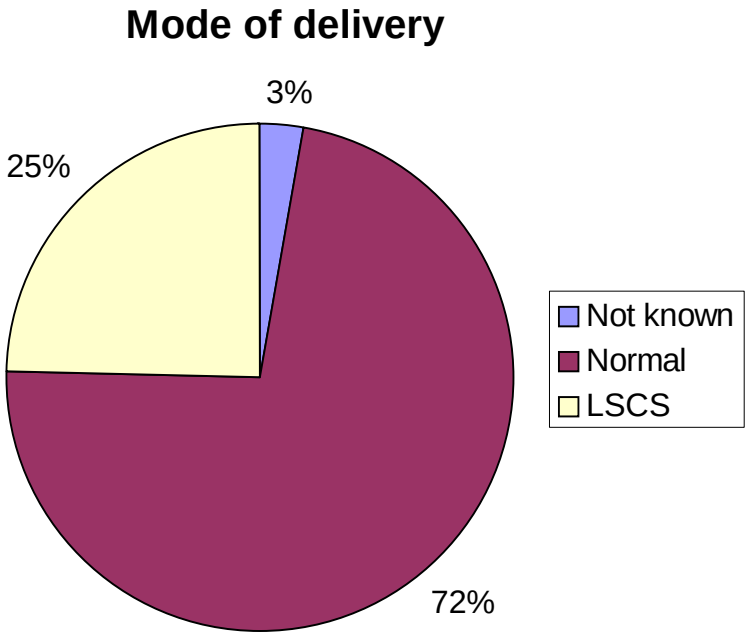
PP =Private practitioner

C.2.Mode of delivery

72% of the mothers delivered their babies normally and, 25% by caesarian section. Percentage delivered by caesarian section is 22.8% in urban areas

according to the 1999 survey in Tamil Nadu in NFHS-2. This study too gives almost similar reports. (Figure 7)

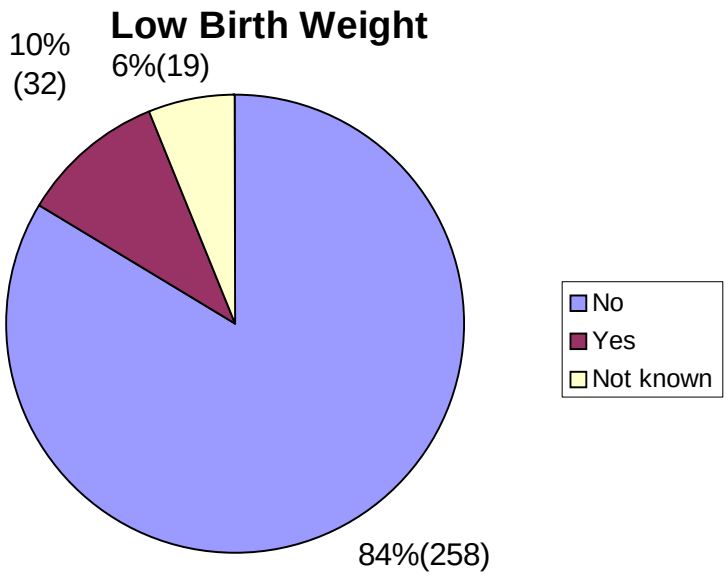
Figure 7



C.3.Low birth weight

10%(32) babies had history of low birth weight. 84%(258) weighed more than 2.5 kg at birth. 13.1% is shown as the percentage of low birth weights in NFHS 2 in Tamil Nadu. (Figure 8)

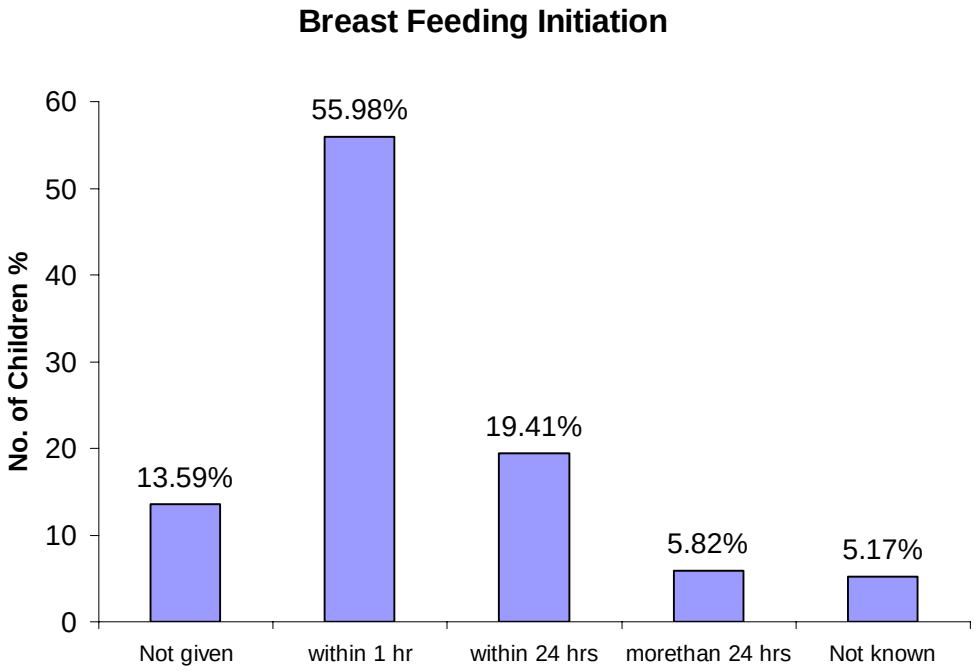
Figure 8



C.4.Initiation of breast-feeding

55.98% of mothers initiated breast-feeding within an hour of delivery. 19.41% within 24 hours and 5.82% after 24 hours. 14% did not feed the child at all with breast milk. (Figure 9)

Figure 9



In a study conducted in Kerala, Percentage breastfed within 1 hour of delivery Without AWCs 85.6 With AWCs 80.0. (Caryn Bredenkamp et al). the reason here could be due to 25% caesarian section delivery because of which initiation of feeds will be delayed since mother will be shifted to the room or ward after an hour of delivery.

251 children were breast fed according to the caretakers/mothers history, after excluding not known and not fed. (Figure 9)

C.5.Immunisation

All children were appropriately immunized for age. (100%)

According to NFHS-2 survey, immunization coverage was 44% and 89% for India and Tamil Nadu respectively. This study report of 100% shows the proper functioning of RCH services and the awareness of immunization in mothers/caretakers.

D. BREAST FEEDING AND WEANING

D.1.Exclusive breast-feeding

137(44.33%) exclusively breast fed their children between 4-7 months. 50 (16.18%) mothers weaned their children after 7 months.

After excluding those who did not breast-feed at all and not known cases (figure 9) 100-(18.8+16.2)=65% had breast fed exclusively for 6 months. This is well above the nation's average where, in 2003, it was found that less than 40 per cent of infants in India were exclusively breastfed during the first six months [BPNI 2003]

D.2.Continous breast-feeding

Mean duration of exclusive breast-feeding is 6.1 months and for continuous breast-feeding, 14.1 months.(table 7)

Table 7

MEAN DURATION OF BREAST FEEDING

	N	Minimum	Maximum	Mean	S D
Exclusive breast feeding	254	1.0	12.0	6.1	2.8
Continued breast feeding	275	1.0	36.0	14.1	9.6

Mean duration of breastfeeding, among children who have been weaned:

In a study conducted in Kerala, by Caryn Bredenkamp et al., 2005

Without AWCs it was 13.4 months, With AWCs it was 12.5 months. Our study reports 14.1 months.

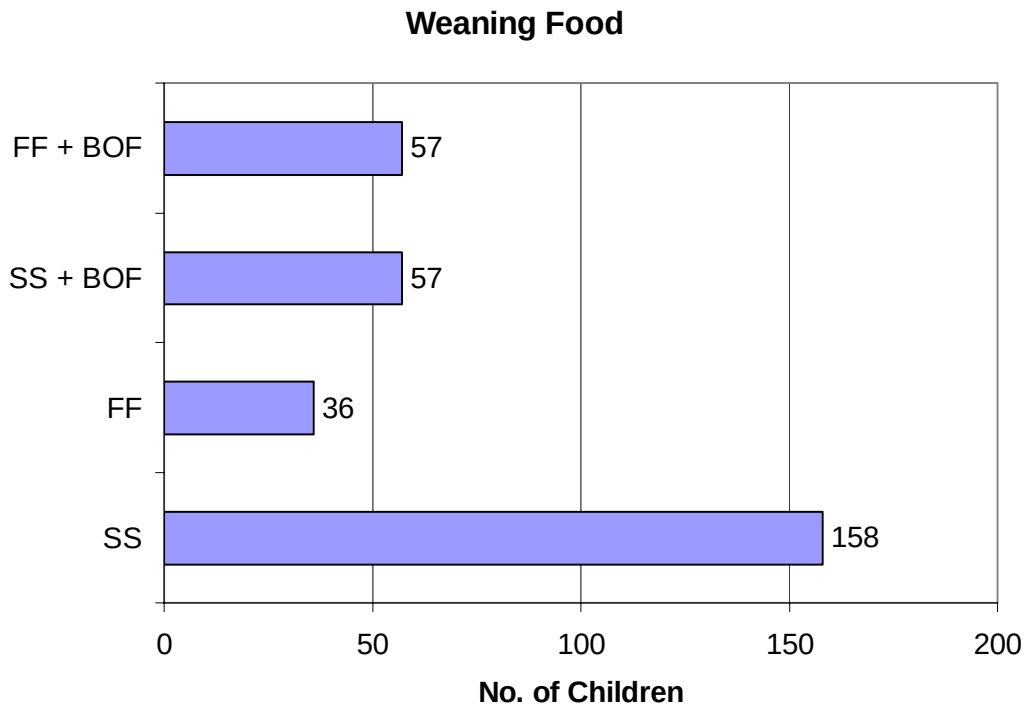
In the interview, it was found that the mothers breast-feed their babies as long as the babies demand or till the conception of next child

D.3.Weaning

Half of the mothers (51.13%) wean their children with semi solid food like mashed rice and potatoes, dhal, idlies etc. 114 children were bottle-fed i.e., 37% and 36(11.65%) with infant formula feeds. (Figure 11)

Although the results show only 37% prevalence of bottle-feeding, many mothers denied the history though in practice they bottle-fed their children. Hence the prevalence may be more than what is reported here.

Figure 11



SS=Semi solid food

FF=Formula feed

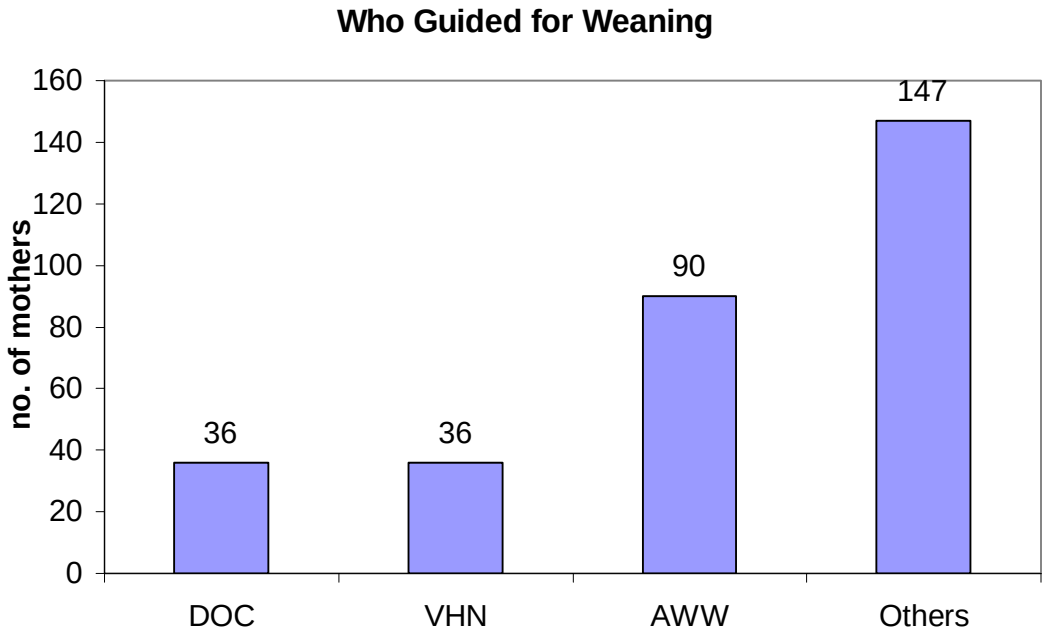
BOF=Bottle feeding

D.4.Nutrition education for weaning

Almost half of the mothers were not counseled or educated by health care workers about when and how to wean their children. They were guided by neighbors, relatives, etc., for initiating and choosing food for weaning.

(Figure 12)

Figure 12



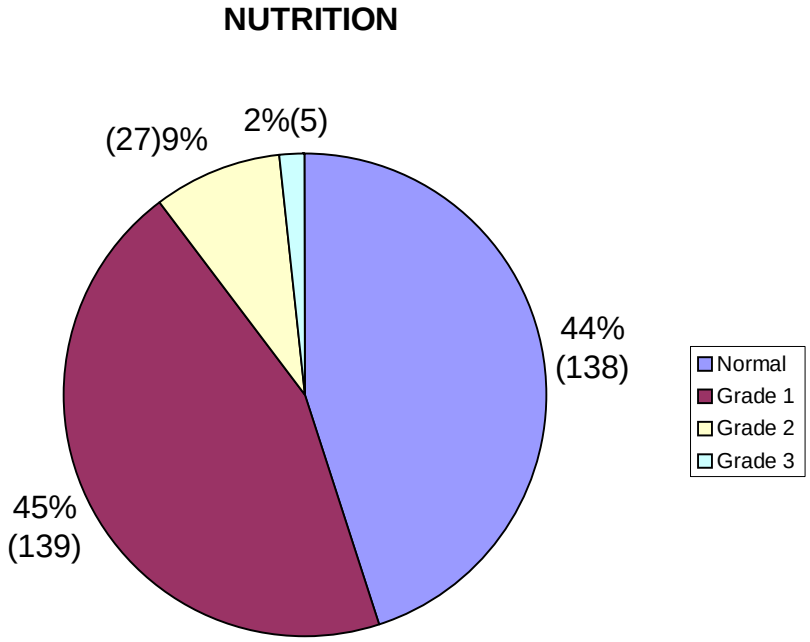
Radhakrishna, R, (1998), Hyderabad, Reports similarly that AWWs do not spend much time for nutrition education to mothers in their areas.

The AWW educate the mothers of those children who attend the ICDS centers. Though regular meetings are conducted for mothers in the AWCs, very few the mothers attend them.

E.UNDERWEIGHT PREVALENCE

56% of the children were underweight by ICDS classification. Grade 1=45% Grade 2 = 9% Grade 3=2% (Figure 13)

Figure 13



The following few studies gave differing results,

In Vadodara underweight -63%, Grade I- 41%; Grade II- 20%; Grade III- 2% (Bhalani KD, 2002). Prevalence is higher because the study was done in those attending ICDS centers where children of undernutrition are sent which could be a bias.

In Chandigarh, underweight -67% (Swami, HM, 1999

In Srinagar underweight -60% Grade I–33% Grade II–21% ≥ Grade III–6% (Bhat IA, 1997) Srinagar study was done in urban settings whereas this study was done in urban slums. Hence srinagar had less prevalence.

In Calcutta underweight- 51% Grade I–28% Grade II–17% ≥ Grade III–7% (Sen PK, 1994) Calcutta study gave similar results but grade 2 nutrition was higher. This study was done in urban slums.

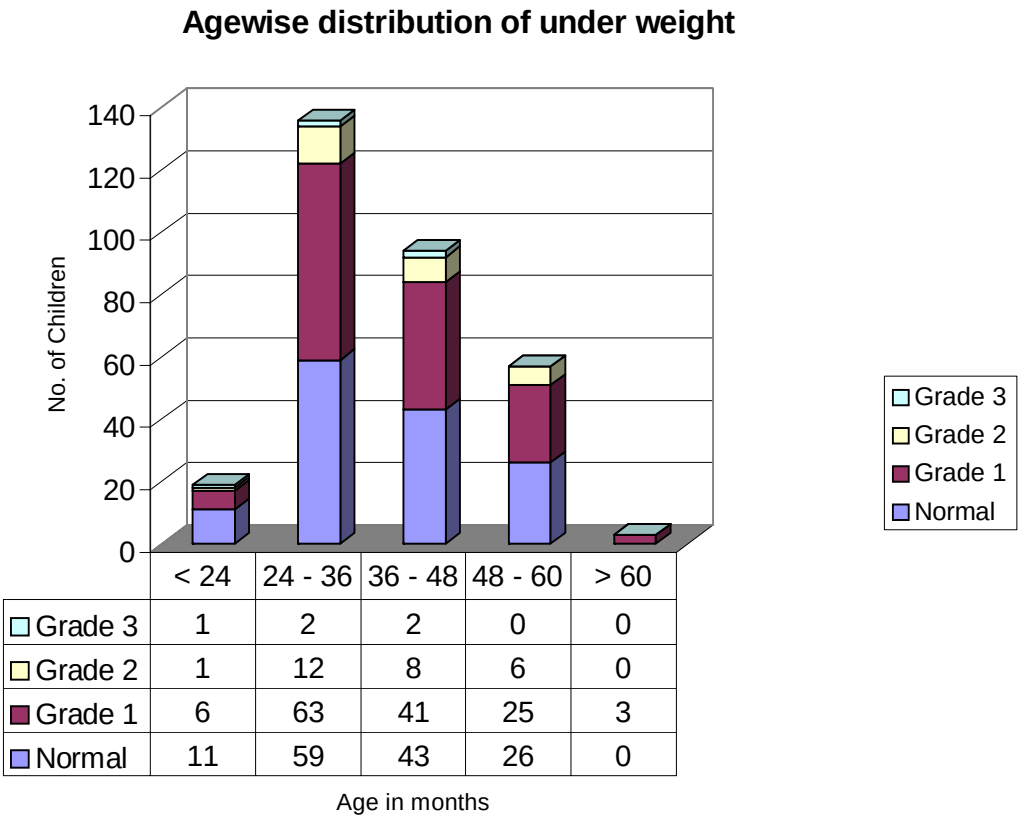
Under weight of Urban poor is 56% according to National Sample Survey Organization (2000).

E.2. Age wise distribution of under nutrition

Most of the children who had grade 1 under nutrition were of the age group 2-3 years. (63) Similarly grade 2 under nutrition is more common in this age group.(figure 14)

The possible reason could be that children of 3 years and above attend anganwadi centers for pre school education and get supplementary nutrition and 2-3 year olds are left behind at home.

Figure 14



	< 24	24 - 36	36 - 48	48 - 60	> 60
Grade 3	1	2	2	0	0
Grade 2	1	12	8	6	0
Grade 1	6	63	41	25	3
Normal	11	59	43	26	0

E.3. Sex of child and Under nutrition

Though Grade 2 under nutrition was more in girl children and proportion of normal weight was more in boys, no statistically significant difference in gender was seen between 2 groups (table 8)

Table 8

SEX WISE DISTRIBUTION OF PREVALENCE OF UNDER NUTRITION

	SEX				Total	
	Male		Female			
Nutrition	Count	%	Count	%	Count	%
Normal	79	47.3	60	42.3	139	45.0
Grade 1	75	44.9	63	44.4	138	44.7
Grade 2	11	6.6	16	11.3	27	8.7
Grade 3	2	1.2	3	2.1	5	1.6
Total	167	100.0	142	100.0	309	100.0

This finding is supported by the following study. Elsewhere in the South Asia region, Trapp et al. (2004) highlight the disappearing sex bias in child health in Bangladesh. Moreover, the sign on the gender coefficient in the economics literature on the determinants of child health in South Asia is not consistently pointed in the same direction.

Survey carried out in rural Kerala found that a higher percentage of boys (82.7%) than girls (75.5%) under six are malnourished by the Gomez classification (National Institute of Nutrition 2002: 74).

E.4.Under weight and socio economic class

When the lower classes (lower & upper lower) and middle classes (lower middle and upper middle) were grouped and compared there's a significant difference between Normal and under nourished children based on their socio economic status.

Table 10

SOCIO ECONOMIC STATUS AND NUTRITION:

Nutrition status/SES	Lower	Middle	Total
Normal	111	28	139
Under nourished	116	54	170
Total	227	82	309

Chi=4.71 df=1 $p < 0.05$ significant

NFHS-2 reports increasing trend of malnutrition with poor standards of living. The result of this study goes on par with the NFHS report

E.5.Under nutrition and order of birth

There appears to be no association between order of birth and under nutrition though NFHS-2 reports increasing grade with increase in order of birth. The finding in this study is against this result. The reason could be the very small number of children in the birth order 3 or more compared to 2 and less than 2, which makes it difficult to bring about a statistical significance.(table 11)

Table 11

ORDER OF BIRTH AND UNDER NUTRITION

ICDS Classification	Order of Birth = Or < 2 Count	Order of Birth > 2 Count	Total Count
Normal	127	12	139
Grade 1	124	14	138
Grade 2	25	2	27
Grade 3	5	0	5
Total	281	28	309

Chi square =0.01 p value >0.05 NS

E.6.Parity and under nutrition

This study shows no relation between parity and under nutrition. But NFHS and other surveys show that prevalence of under nutrition increases with increasing parity of the mother.(Table 12)

Table 12

PARITY AND UNDER NUTRITION

Nutrition	No. of Children =< 2 Count	No. of Children > 2 Count	Total Count
Normal	124	15	139
Grade 1	118	20	138
Grade 2	22	5	27
Grade 3	5	0	5
Total	269	40	309

E.7.Anemia in mothers and under nutrition

All the 3 grades of under nutrition are significantly higher in anemic mothers. The reason could be due to low birth weight, which in turn results in under weight. This finding is on par with khor et al., 2003

Table 13

ANEMIA IN MOTHERS AND UNDER WEIGHT

	Anaemia during pregnancy			
	Not known	Yes	No	Total
Nutrition	Count	Count	Count	Count
Normal	8	24	107	139
Grade 1	9	38	91	138
Grade 2	1	13	13	27
Grade 3	1	2	2	5
Total	19	77	213	309

Chi square = 7.52 $p < 0.05$ significant

E.8. Exclusive Breast Feeding and under weight

Children weaned after 7 months tend to have more chances of under nutrition. This is shown to be statistically significant. (Table: 14)

Table 14

UNDER WEIGHT AND WEANING

Nutrition	<7 months	> 7 months	Total
Normal	125	14	139
U/W	134	36	170
Total	259	50	309

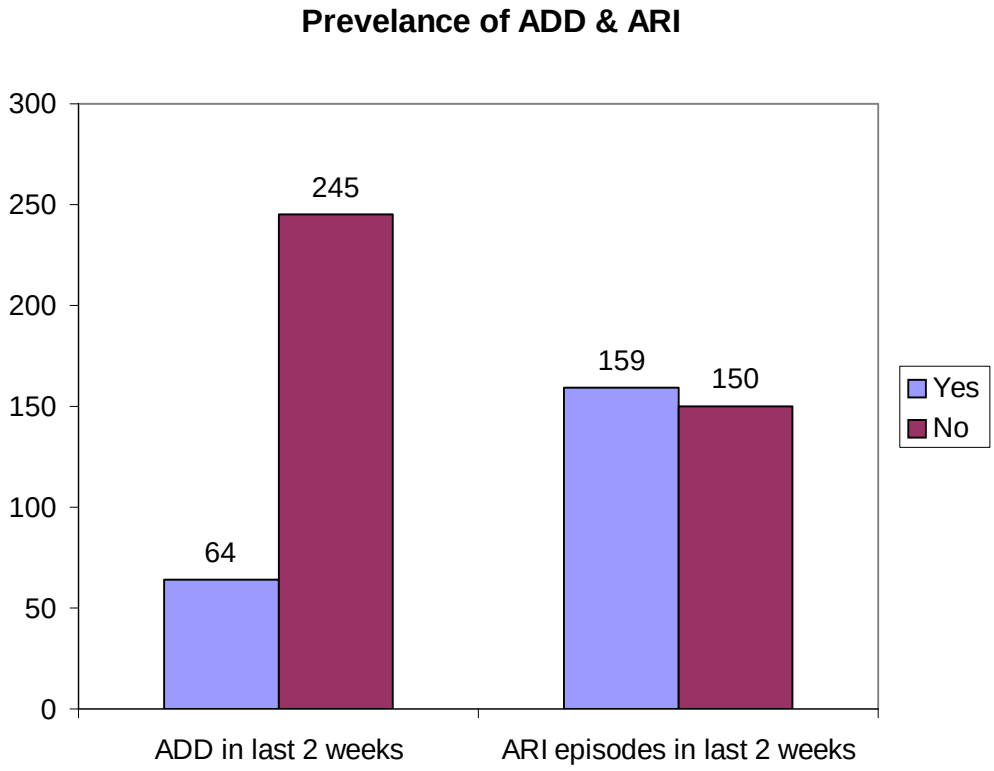
Chi square= 6.15 p value <0.05 Significant

F.CHILDHOOD ILLNESSES

F.1.Prevalence of acute diarrheal diseases

20.7% of the children had acute diarrheal disease in the preceding two weeks of the survey. The prevalence was slightly higher in male children. (Table 16) 51.5% was the prevalence of Acute Respiratory Infection in the study population.

Figure15



As per NFHS-2, thirty percent of children under age three had fever during the two weeks preceding the survey, 19 percent had symptoms of ARI, and 19 percent had diarrhea.

F.2.Under nutrition and ADD

There is no significant association between ADD episodes and under nutrition. (Table 15)

Table 15

Nutrition	ADD episodes in a year						Total	
	Not known		< 3 times		> 3 times			
	No.	%	No.	%	No.	%	No.	%
Normal	17	68.0	91	43.3	31	41.9	139	45.0
Grade 1	6	24.0	98	46.7	34	45.9	138	44.7
Grade 2	2	8.0	19	9.0	6	8.1	27	8.7
Grade 3	0	0.0	2	1.0	3	4.1	5	1.6
Total	25	100.0	210	100.0	74	100.0	309	100.0

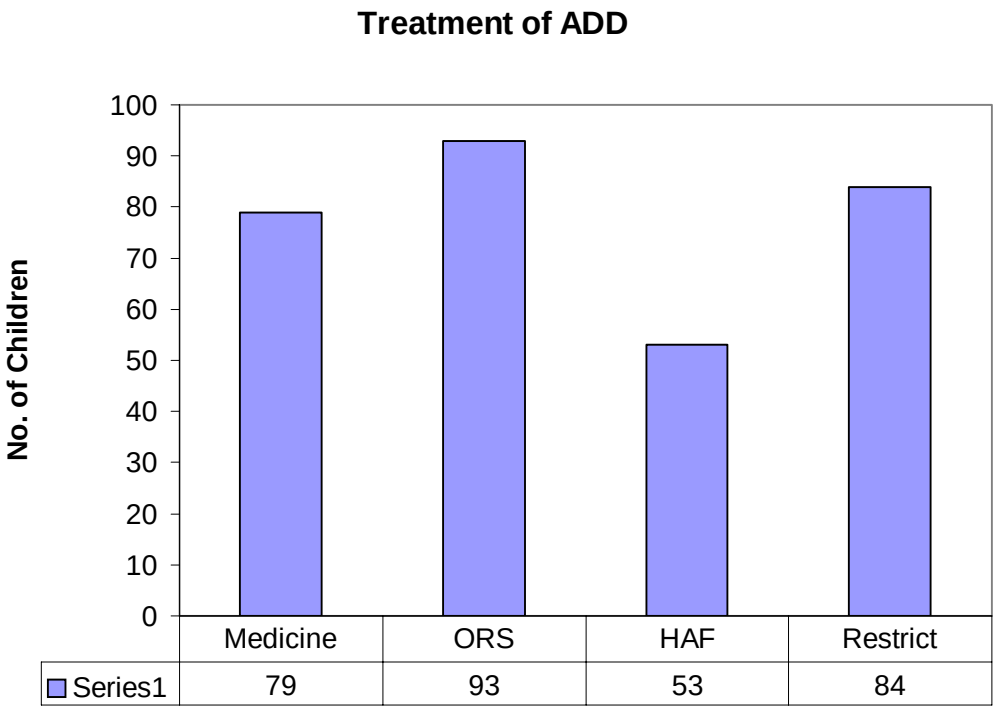
There is no significant association between ADD episodes and under nutrition.

F.3.Treatment of ADD

27% of the mothers restrict feeding and liquids in children with diarrhea. The others managed appropriately. (Figure 16)

Among children sick with diarrhoea in the two weeks prior to the survey, the proportion that were given some form of ORT varies from 90 percent in Kerala, 76 percent in Goa, and 73 percent in West Bengal to 34 percent in Rajasthan and 36 percent in Uttar Pradesh. The proportion given ORS varies from 56 percent in Goa and 51 percent in Manipur to only 15-16 percent in Bihar and Uttar Pradesh (Singh P, 2000).

Figure 16



27% restriction of feeds

30% ORS

25.56% medicine

17.15% home available fluids

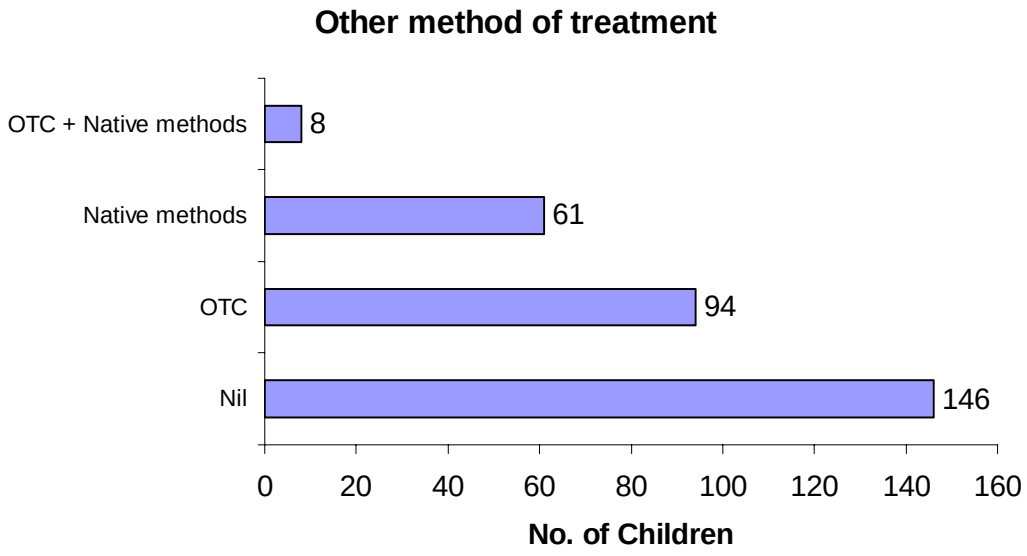
According to NFHS 2, Percentage of children treated with ORS 27.3%, home made sugar-salt water solution 3.4%, Taken to a health facility or provider 67.3%, Oral Rehydration salt (ORS) packets 27.9%, Home remedy/ herbal medicine 9.2%, no treatment 21.6%

The mothers / care takers seem to restrict the children from taking food and even liquids during diarrheal episodes, which denotes the ignorance of Rehydration concept in these people.

F.4.Treatment of childhood illnesses

Over The Counter purchase of drugs is seen in 102(33.3%) of the mothers. 69 mothers are still following native methods of treatment. (Figure 17)

Figure17



F.5.Health seeking behavior

Majority of mothers took children to health care if the child has breathing difficulty or fever. Diarrhea becomes less in priority where it gets treated at home in many families. (Table 16)

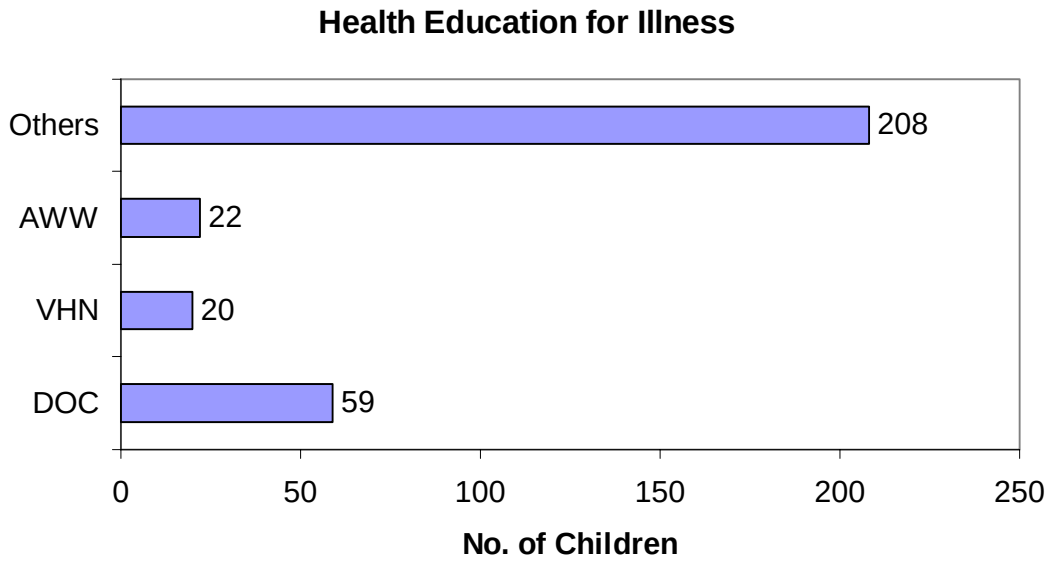
Table 16

Symptoms	Breathing difficulty	Diarrhea	Refuse feeds	Fever
Mothers	225	45	136	210

F.6.Health education for childhood illnesses

More than 2 thirds of the mothers treat their children on their own, or by the advice of neighbours, relatives, etc. (Figure 18)

Figure 18



NFHS-2 reports, Sixty-four percent of children received some advice or treatment from a health facility or health provider when ill with ARI.

Treatment sought for ARI from a health care provider, is 64% for India and 82.9% for Tamil Nadu.

This study shows that health care providers do not educate the mothers on treatment and prevention of illnesses.

SUMMARY

SUMMARY

The study done in urban slums of north chennai in 6 month to 6 years age group reveal 56% prevalence of under nutrition. < 1 % had grade 3 malnutrition. 2 family norms are followed in more than 80% of the families. > 90% seek antenatal care and perinatal care in government health care facilities.25% had anemia in antenatal period. TT and IFA consumption showed 100% coverage indicating good RCH coverage.10% had low birth weight, which is less than the state's average and 56%, initiated breast-feeding within 1 hour. There was a satisfactory period of exclusive and continuous breast-feeding period of 6 and 14 months on average. Immunization coverage of children is 100%. Majority weaned their children around 6 months, which is the recommendation now. Nutrition education by AWWs and VHNs is not satisfactory. They cover less than 50% of the mothers.

Prevalence of under nutrition is 56% in the study, which is more than the nation's average. Gender is not vulnerability for under nutrition in these slums. Parity, order of birth is not associated with under weight. Anemia in mothers and socio economic status and period of exclusive breast-feeding period were found to be significantly associated with under weight.

Prevalence of ADD (21%) and ARI (51%) are more than the nation's rate in the slum. 27% restricting feeds during diarrhea. Native methods of treatment

and over the counter purchase of drugs are still followed in the community. People depend on the knowledge of relatives, neighbours for treatment of childhood illnesses. AWW and VHN cover a very small proportion (<15%) fever and breathing difficulty makes the mothers to reach health care, otherwise they try managing at home.

RECOMMENDATIONS

RECOMMENDATIONS

The prevalence of under weight is well above the state's prevalence. to improve their nutrition,

- The AWW should counsel the mothers on nutrition not only during the meetings in AWCs but also in the community. Time of weaning and type of weaning should be emphasized in the mothers
- Preventing anemia in the antenatal period can reduce the under weight as the study suggests. Since majority of the mothers come to government health care facilities, identifying and treating the anemia is possible by VHNs and AWWs.
- The proportion of under weight is more in 2-3 year age group, hence sending children to AWCs at this age can reduce the prevalence, apart from educating the mothers on nutrition.
- Since SES is significantly associated with under weight, they should be more concentrated and their standard of living should be improved.
- Health education for preventing and treating childhood illness is inadequate. Both the AWWs and VHNs should work together and spend more time on giving health education to mothers.

LIMITATIONS

LIMITATIONS

The study is a cross sectional one and so the significance of relationship between nutrition and the factors associated with it should be considered with caution.

The study is done in the slums of north chennai alone. Ideally it should be evenly done all over the slums of the city by proper sampling.

Rapid assessment with single parameter of weight for age alone was done. To assess the nutritional status other anthropometric measurements should be done. If done so, probably the expected significance with the parameters of children like order of birth, bottle-feeding related to under nutrition, etc could have been brought out.

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APPENDICES

APPENDIX-1

QUESTIONNAIRE

A.SOCIO DEMOGRAPHIC PROFILE:

FATHER

1.Name

2.Age

3.Age at marriage

4.Education 1. Illiterate 2**.**primary school/literate 3.middle school completed 4.high school certificate 5.post high school/diploma 6.degree

5.Occupation 1.unemployed 2.unskilled worker 3.semi skilled worker 4.skilled worker 5.clerk/shop owner 6.semi profession

MOTHER:

6.Name

7.Age

8.Age at marriage

9.Education **1** Illiterate **2.**primary school/literate **3**.middle school completed **4**.high school certificate **5**.post high school/diploma **6.**degree

10.Occupation 1.Unemployed 2. Employed

FAMILY

11.Religion 1.Hindu 2.Christian 3.Muslim 4.Others

12.Total no. of children

13.Total income of the family

14.Total household members

15.Per capita income

B.ANTE NATAL/INTRANATAL HISTORY

16.How many times did you go for check up in the antenatal period for this baby? ☐

1. <3 times 2. 3-5 times 3. >5 times

17. Where did you go for antenatal care?

1. Tertiary govt hospital 2. Urban health post 3. Private practitioner ☐

18.Were you told that you were Anemic during antenatal period?

1.yes 2.no ☐

19.Did you take Supplementary food during antenatal period given by

The Anganwadi Worker? 1.yes 2.no ☐

20.Did you have TT Injection during antenatal period? 1.yes 2.no ☐

21.If yes, How many injections? 1.one 2.two ☐

22.Did you take Iron Folic acid tablets during pregnancy? 1.yes 2.no ☐

23.Where was the child delivered?

1.Tertiary govt hospital 2. Urban health post 3. Private practitioner 4.othe ☐

24.What is the mode of delivery? 1.vaginal delivery 2.ceasarian section ☐

C. POST NATAL HISTORY:

25.When was breast-feeding initiated? ☐

1.not given 2.within 1 hour of delivery 3. <24 hours 4. > 24 hours

26.How long was the child exclusively breast-fed? ☐

27.Are you still breast-feeding/ how long was it continuously breast-fed? ☐

D.IMMUNISATION:

☐

28.Is the child immunized for age? 1.yes 2.no

29.Who motivated to immunize?

1.doctor 2.Village health nurse 3.anganwadi worker

4.self/relatives/neighbours

E.WEANING:

30.What was the child weaned with?

1.Semi solid food 2. Formula feed 3. Bottle-feeding 4.others

31.Who educated you about when and with what to wean?

1.doctor 2.Village health nurse 3.anganwadi worker

4.self/relatives/neighbours

F.CARE OF ILLNESS

ACUTE DIARRHEAL DISEASE

32.Has the child had diarrhea in the last 2 wks?

(i.e., >3 loose/watery stools/day or bloody stool) 1.yes 2.no

33.If yes, where was the child treated? 1.home 2.health facility

34.Who treated?

1.doctor 2.Village health nurse 3.anganwadi worker

4.self/relatives/neighbours

35.How was it managed?

1.Medicines 2. Restriction of feeding 3. Infant formula feed

4. Home Available Fluids (Kanji, rice water, tender coconut, etc)

5. Water alone 6.Oral Rehydration Salt Solution 7.Others? (Specify)

36.How many episodes of diarrhea in the last 1-year? 1. <3 times 2. >3times

ACUTE RESPIRATORY INFECTION:

37.Has the child had illness with cough in the last 2 weeks? 1.yes 2.no

38.If yes, did the child breath faster than usual with short quick breaths or have difficulty breathing? 1.yes 2.no

39.Where was the child treated? 1.home 2.health facility

40.Who treated?

1.doctor 2.Village health nurse 3.anganwadi worker 4.self/relatives/neighbours

41.Were symptoms due to problem in 1.chest or 2.blocked nose?

42.How many episodes in the last 1-year? 1. <3 times 2. >3times

43.Where do you seek care for illnesses usually?

1.Govt. Hospital 2.UHP 3.VHN 4.GP 5.Hospital 6.Pharmacy 7.Others (native methods/Traditional healers)

44.Who guides/educates/motivates you in preventing/treating childhood illnesses?

1.doctor 2.Village health nurse 3.anganwadi worker 4.self/relatives/neighbours

45.What types of symptoms would cause you to take child to health facility right away?

1. Not able to drink/Breast Feed 2. Become sicker 3. Develops fever

4. Has fast breathing 5. Has difficult breathing 6. Blood in stools

7. Drinking poorly 8. Others

H.CHILD:

46.Name

47.Age in months:

48.Sex: 1.male 2.female

49.Order of birth:

50.Gestational age: 2. Term 2.Preterm

51.Birth weight in kilograms:

52.History of low birth weight: 1. Yes 2.No

53.Weight of child at the time of survey

54.Grade of nutrition:

tptug; gl;oay;

je;ij tpguk;

1/ bgah; :

2/ taJ :

3/ jpUkz taJ :

4/ fy;tp jFjp : 1/ gof;fhjth;. 2/ Muk;gf;fy;tp. 3/ eLepiyg;gs;sp. 4/ cah;epiyg;gs;sp. 5/ nky;epiyg;gs;sp. 6/ ,sk; fiy

5/ bjhHpy; : 1. ntiy mw;wth;. 2/ El;gk; rhuh bjhHpy;. 3/ gFjp El;gk;rhuh bjhHpy; 4/ El;gk;rhuh bjhHpy; 5/ fpshh;f;-filepiy-epy chpikahsh;

jha; tpguk; :

6. bgah; :

7. taJ :

8. jpUkz taJ :

9/ fy;tp jFjp : 1/gof;fhjth;. 2/ Muk;gf;fy;tp. 3/ eLepiyg;gs;sp. 4/ cah;epiyg;gs;sp. 5/ nky;epiyg;gs;sp. 6/ ,sk; fiy

10/ bjhHpy; : 1. ntiy mw;wth; 2/ ntiy bra;fpwth;

FLk;g tpguk; :

11. kjk; :

12. bkhj;j FHe;ijfs; :

13/ bkhj;j FLk;g tUkhdk; :

14/ bkhj;j FLk;g cWg;gpdh;fs; :

15. jdp egh; tUkhdk; :

ngW fhy ftdpg;g[; :

16. jw;nghija fh;g;gj;jpd; nghJ- ,e;jf; FHe;ij fh;g;gj;jpy; ,Uf;Fk; nghJ. vj;jid Kiw kUj;Jtkidf;F ghpnrhjidf;F brd;wPh;fs; >

1/ 3(Kd;W) Kiwf;Fk; Fiwt[2/ 3 ? 5 Kiw
3/ 5/Kiwf;F nky;

17/ v';F brd;wPh;fs;>

1/ muR kUj;Jtkid 2/ khefuhl;rp kUj;Jtkid
3/ jdpahh; kUj;Jtkid

18/ ,e;j FHe;ij fh;g;gj;jpy; ,Uf;Fk; nghJ c';fSf;F ,uj;j nrhif ,Ue;jjh >

1/ Mk; 2/ ,y;iy

ngWfhy ml;il ,Ug;gpd; fhz;gpa[';fs;/

19/ mg;nghJ. m';fz;tho gzpahsh; bfhLf;Fk; rj;JUz;il kht[rhg;gpl;Oh;fsh>

1/ Mk; 2/ ,y;iy

25/ FHe;ij gpwe;j gpwF . vg;nghJ jha;g;ghy; bfhLf;f Muk;gpj;jPh;fs;>

27/ jpl czt[ld; vt;tst[ehs; jha;g;ghy; bfhLj;jPh;fs;>

28/ FHe;ijf;F jFe;j fhyj;jpy; nghl ntz;oa jLg;g[Crp nghl;Oh;fsh>

29/ jLg;g[Crp nghl brhy;yp c';fis Cf;fg;gLj;jpaJ ahh;>

1/ kUj;Jth; 2/ Rfhjhu gzpahsh; 3/ m';fz;tho gzpahsh;
4/ cwtpdh;-gf;fj;J tPl;odh;

30/ FHe;ijf;F vd;d jplczt[bfhLf;f Muk;gpj;jPh;fs;

1/ krpj;j czt[2/ brhpyhf;. be!;lk; nghd;w ghy; gt[lh;
3 g[l;oghy;

31/ jplczt[bfhLg;gJ gw;wp j';fis Cf;Ftpg;gJ ahh;>

1/ kUj;Jth; 2/ Rfhjhu gzpahsh; 3/ m';fz;tho gzpahsh;
4/ cwtpdh;-gf;fj;J tPl;odh;

32/ ,e;j FHe;ijf;F fle;j 2 thuj;jpy; gapw;W nghf;F ,Ue;jjjh (XU ehisf;F 3 Kiwf;F nky; (,uj;jk; fye;J)

1/ Mk; 2/ ,y;iy

33/ Mk;; vdpy;. v';F rpfpr;ir bra;jPh;fs;>

1/ tPl;oy; 2/ kUj;Jtkidapy;

34/ ahh; rpfpr;ir mspj;jhh;fs;

1/ kUj;Jth; 2/ Rfhjhu gzpahsh; 3/ m';fd;tho gzpahsh;
4/ cwtpdh;-gf;fj;J tPl;odh;

35/ vt;thW rpfpr;ir mspf;fg;gl;lJ>

1/ kUe;J-khj;jpiu 2/ Mjhuk; bfhLf;fhky; ,Uj;jy;
3/ g[l;oghy; 4/ f";rp- ,sePh;- Kjypait 5/ jz;zPh; kl;Lk;
6/ ORS gt[lh; 7/ kw;wit/

36/ vt;tst[Kiw xU tUlj;jpy; tapw;Wg;nghf;F MfpwJ/

1/ < 3 Kiw 2/ > 3Kiw

37/ ,e;jf; FHe;ijf;F fle;j 2 thuj;jpy; ,Uky; -rsp ,Ue;jjh

1/ Mk; 2/ ,y;iy

38/ Mk; vdpy; Kr;R tpLtjpy; FHe;ijf;F rpukk; ,Ue;jjh (m) rj;jk; te;jjh>

1/ Mk; 2/ ,y;iy ☐

39/ v';F rpfpr;ir mspf;fg;gl;lJ>

1/ tPL 2/ kUj;Jtid ☐

40/ ahh; rpfpr;ir mspj;jhh;>

1/ kUj;Jth; 2/ Rfhjhu gzpahsh; 3/ m';fd;tho gzpahsh;
4/ cwtpdh;-gf;fj;J tPl;odh;

☐

41/ FHe;ijf;F K:r;RtpLk; bghGJ tapw;W gFjp ,Gj;Jf; bfhs;Skh

1/ Mk; 2/ ,y;iy ☐

42/ vt;tst[Kiw xU tUlj;jpy; ,e;j rpukk; ,Uf;fpwJ>

1/ < 3 Kiw 2/ > 3Kiw ☐

43/ ,e;jg; gpur;ridf;F v';F rpfpr;ir bra;J bfhs;tPh;fs; >

1/ muR kUj;Jtkid 2/ khefuhl;rp kUj;Jtkid
3/ kUe;J fil 4/ jdpahh; kUj;Jtkid 5/ kw;wit

44/ FHe;ijf;F tUk; neha;fis jLg;gJ- rpfpr;ir mspg;gJ gw;wp Mnyhrid bfhLg;gJ ahh;>

1/ kUj;Jth; 2/ Rfhjhu gzpahsh; 3/ m';fd;tho gzpahsh;
4/ cwtpdh;-gf;fj;J tPl;odh;

45/ vd;d gpur;rid ,Ue;jhy; cldoahf kUj;Jtkidf;F FHe;ijia bfhz;L bry;tPh;fs; >

1/ cz;z- ghy; Fof;f kWj;jhy; 2/ fha;r;ry; te;jhy;
3/ ntfkhf K:r;R tpl;lhy; 4/ K:r;Rtpl rpukg;gl;lhy; 5/ rPjngjp 6/ kw;wit

FHe;ij

1/ bgah; :

2/ taJ : ☐

3/ ghy; : 1. Mz; 2/ bgz; ☐

4/ vj;jidahtJ FHe;ij : ☐

5/ FHe;ijapd; tsh;r;rp :

1. epiw khjk; 2/ Fiw khjk; ☐

6/ gpwe;j nghJ vil : ☐

7. Fiwe;j vilapy; gpwe;jjh :

1/ Mk; 2/ ,y;iy ☐

8/ FHe;ijapd; Cl;lr;rj;jpd; epiy

☐

APPENDIX-2

SOCIO-ECONOMI STATUS-MODIFIED KUPPUSAMI SCALE

ITEMS	WEIGHTAGE
A. Education of head of household	
Professional degree, postgraduate	7
B.A or B.Sc degree	6
Post high school, diploma	5
High school certificate	4
Middle school completion	3
Primary school or literate	2
Illiterate	1
B. Occupation- head of household	
Profession	10
Semi-profession	6
Clerk, shop owner	5
Skilled worker	4
Semi-skilled worker	3
Un-skilled worker	2
Un-employed	1
C. Per Capita Income	
1829 or above	12
913-1828	10
684-912	6
455-683	4
272-454	3
91-271	2
<91	1

TOTAL SCORE= A+B+C

26-29	Upper
16-25	Upper middle
11-15	Lower middle
5-10	Upper lower
<5	Lower

APPENDIX-3

Areas surveyed in north chennai covered by ICDS programme for the study

	ICDS center no	street names	no. of children
Project area 6:	507:	Ramasamy street:	6
Puliyanthope:		Mannarsamy Street	5
		Thiruvenkatasamy Street	14
	666:	G3 thideer nagar	25
	506:	V.O.C. Street 1-5	25
	518:	Ammayammal Street	16
		Kuttithambiran Street	9
	517:	Balu Naicker Street	13
		Govinda Singh Street	4
		Lal Singh Street	9
	535:	Nachiyarammal street	26
	537:	Kuravan kulam Lane 1 &2	25
Choolai:	508:	Ambedkar nagar 2-8 Streets	27
	510:	Narayanasamy Street	26
	523:	Old slaughterhouse street-1	28
	538:	Market Street	25
	534:	Choolai post office	27